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## HOSE FITTING

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[0001] The invention relates to a hose fitting for high pressure applications, with the hose being provided at least on one side with a sealing head and a spigot nut. The spigot nut is provided with at least one relief bore which forms a discharge channel for the medium flowing through the fitting on the low pressure side of a sealing means arranged on the sealing head.

[0002] Hose fittings of the aforementioned type serve to couple and connect, for example, high pressure water hoses that are impacted with more than 100 to several thousand bar. It is easily conceivable that leaks and flaws on hose connections and coupling fittings represent a very significant safety issue.

[0003] It is known to provide relief bores in the spigot nut of the respective hose fittings. Such bores allow a medium, under pressure, such as water, to flow off if the sealing means fail. The small cross section of the relief bores is selected in such a way that the greatest possible volume of medium under pressure can be discharged in order to allow the greatest possible pressure relief or to prevent a further increase in pressure to occur.

It is apparent to the person of skill in the art that in view of these circumstances, it is desirable to select the largest possible cross-sectional clearing for the relief bores.

[0004] However, since such relief bores represent weaknesses in the materials constituting the fitting, the diameter of the relief bores can usually not be as large as desired due to strength considerations. Usually, the diameter of the relief bores must be so small that the high pressure jet of the medium exiting as a result of the leak may still be a significant safety risk.

Depending on the impacting pressure of the pipe or the respective hose involved, the jet may still be so strong that it may cause bodily injuries.

[0005] In one variant of a known hose fitting of the aforementioned type, the relief bores were arranged approximately radially within the spigot nut. In order to minimize the risk of injury caused by failure of the sealing means arranged on the sealing head, the arrangement of the relief bores was

changed to extend axially within the spigot nut. This arrangement has proven to be successful for most application in that occasionally the medium discharged from the relief bores in some fittings impacts adjacent coupling components and is then diffused. This is especially the case if straight coupling pieces are involved.

[0006] However, if curved coupling pieces or curved fittings, are involved, the high pressure medium can exit freely, at least from one relief bore, so that in some cases the risk of injury still exists.

[007] German Patent DE 19,923,173 C2 discloses a coupling member for connecting a system of hoses that are subjected to the high pressure , wherein the coupling member is provided with a pressure fitting comprising a pressure housing and a hose nipple and a sealing head which, viewed from the direction in which it is connected, is provided with a sealing head which is arranged at the front end of the nipple that projects from the end of the hose, with the sealing head being either connected by a spigot nut at the neck of the nipples or it is made to contact the sealing seat provided on the counter piece by way of an external thread provided on the neck..

The coupling member is characterized in that in order to relief pressure, at least one relief bore is provided which passes axially through the sealing head. In order to ensure the vaporization and/or nebulization of the high

pressure medium coming from the relief bores, the bores are arranged in such a way that the medium flows against the front end of the pressure housing of the fitting. In such a case, there is always the possibility, even if coupling members are curved, or if the fittings are curved, that the high pressure medium is discharged freely from the relief bores so that, now as before, there is no risk of injury.

[0008] It is therefore the object of the present invention to improve the hose fitting of the aforementioned type in such a way that the risk of injury is significantly decreased when the sealing means fail.

[0009] The problem under consideration is solved by a hose fitting having the characteristics as defined in Claim 2 and is characterized in that the relief bores are configured in such a way that they effect a release and/or nebulization of the medium which may be discharged from the same in the immediate region of the orifice. This causes the entire kinetic energy of the medium under pressure directly to be decreased in the region of the orifice in the relief bore, and the flow of the medium flowing out of the coupling is vaporized and/or nebulized so that the bundled jets that are projected into space are not present, and this is especially advantageous from the point of view of safety.

[0010] Two release bores are preferably provided.

[0011] In a preferred variant of the hose fitting according to the invention, the relief bores are configured to extend converging relative to one another at an angle to the axis defined by the male fitting.

[0012] It is especially advantageous when the relief bores are fashioned in a free space provided on the low pressure side of the sealing means between the spigot thread and the sealing head or the fitting body of the fitting. The screw nut is advantageously configured as spigot nut. The free space is advantageously formed by an annular space provided in the direction of the thread behind the thread of the spigot nut. This annular space may be formed by an undercut during the manufacturing process of the spigot nut.

[0013] It is especially advantageous if each of the relief bores borders on the inside diameter of the spigot nut and leads from there toward the outside.

[0014] To ensure equal pressure, the relief bores are provided at diametrically opposite locations at the circumference of the spigot nut.

[0015] Said relief bores are preferably arranged in such a way that the discharged medium stream directly impacts the fitting body in the region of the orifice. This causes vaporization and/or nebulization of the medium exiting the relief holes directly within the region of the orifice.

[0016] The relief bores are advantageously arranged at an  $19^{\circ}$ - $23^{\circ}$  angle relative to the axis defined by the direction of the thread.

[0017] The invention is further elucidated by means of an embodiment illustrated in the drawing [0018] in which:

[0019] Fig. 1 is a schematic partial view of the hose coupling, including a hose fitting according to the invention; and

[0020] Fig. 2 is a cross-sectional view along lines II-II in Fig. 1.

[0021] The hose fitting illustrated in Fig. 1 essentially comprises a fitting body 2 in the form of a tubular or curved piece having a sealing head 3, which is shaped on in one piece, and a spigot nut 4.

[0022] At the end of the fitting body, away from the sealing head 3, holding ribs 5 are configured on the same to which a hose end (not illustrated) is pressed with a fitted end.

[0023] The person of skill in the art will immediately realize that the inventive fitting cannot only be used to couple and/or connect hoses, but also to couple and /or connect pipes. In the illustrated embodiment, the fitting body 2 is configured to receive a hose, on the one hand, and to seal the coupling, on the other hand. In the illustrated embodiment, this coupling piece is provided with a conical seat 7 which accommodates the conical end of the sealing head 3. At the outer circumference of the conical sealing head 3 a surrounding groove 8 is provided to accommodate a sealing element 9.

[00024] The sealing head 3 is pulled with its conical end through the spigot nut 4, past the collar 10 that surrounds that end, and into the seat 7.

[0025] The inventive fitting can be configured as an intermediate piece and may be curved or straight. In this case, a sealing head would be provided at each end. It is apparent to the person of skill in the art that the configuration of the hose fitting with respect to the components that are to be connected or coupled is not important.

[0026] As clearly illustrated in the partial view of Fig. 1, the passage through the spigot nut 4, which is provided with the internal thread 11, is provided with a surrounding undercut which forms a surrounding annular space 12 between the collar 10 and the spigot nut 4. This annular space 12 is located in the direction in which the spigot nut 4 is screwed behind the internal thread 11. The passage through the spigot nut 4 narrows in the direction behind the annular space 12 in such a way that the axial forces are transferred to the collar 10.

[0027] Reference numeral 14 designates two diametrically opposite relief bores by way of which the annular space 12 communicates with the surroundings. The relief bores extend at an angle to the axis defined by the direction of the thread, i.e., converging toward one another. In the illustrated embodiment the angle of each of the relief bores 14 relative to the

longitudinal axis of the thread is approximately 21°. The relief bores 14 are arranged in such a way that they border on the smallest inside diameter of the spigot nut 4 and pass through the same. This is especially clear from thin the cross-sectional view in Fig. 2. The result is that any medium streaming out of the relief bores 14 impacts the fitting body 2 directly in the region of the orifice of the relief bores 14 and is vaporized and nebulized in this process.

## Reference Numerals

- 1 Hose fitting
- 2 Fitting body
- 3 Sealing head
- 4 Spigot nut
- 5 Ribs
- 6 Coupling piece
- 7 Conical seat
- 8 Groove
- 9 Sealing element
- 10 Collar
- 11 Inside thread
- 12 Annular space
- 13 Support shoulder
- 14 Relief bores

## CLAIMS

1. Hose fitting for high pressure applications, with the hose being provided at least on one side with a sealing head and a spigot nut, with the spigot nut being provided with at least one relief bore which forms a discharge channel for the medium flowing through the fitting on the low pressure side of a sealing means arranged on the sealing head, characterized in that the relief bores (14) extend at an angle to the axis defined by the direction thread engagement in such a way that the medium stream exiting from said relief bores may impact the fitting body (3) directly in the region of the orifice of the relief bore (14) in such a way that the release and/or nebulization of the medium stream occurs direction in the region of the orifice of the relief bores (14).

2. The hose fitting as defined in Claim 1, characterized in that two relief bores (14) are provided.

3. Hose fitting as defined in one of Claims 1 or 2, characterized in that the relief bores are fashioned in a free space provided on the low pressure side of the sealing means between the spigot thread and the sealing head (3) or the fitting body (2).

4. Hose fitting as defined in one of Claims 1-3, characterized in that the coupling is configured as spigot nut (4).
5. Hose fitting as defined in one of claims 1-4, characterized in that the free space is formed by an annular space (12) arranged in the direction of the thread behind the thread (11) of the spigot nut (4).
6. Hose fitting as defined in one of claims 1-5, characterized in that the relief bores (14) are fashioned in the discharge direction on the inside diameter of the spigot nut (4) and lead from there toward the outside.
7. Hose fitting as defined in one of Claims 1-6, characterize in that the relief bores (14) are provided at diametrically opposite locations on the circumference of the spigot nut (4).

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